1247-0855-0V PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :

PHILIPPE BOIRE ET AL : EXAMINER: PIZIALI

SERIAL NO: 09/486,719 :

FILED: AUGUST 2, 2000 : GROUP ART UNIT: 1775

FOR: GLAZING WITH OPTICAL AND/OR ENERGETIC PROPERTIES CAPABLE OF BEING ELECTRICALLY CONTROLLED

APPEAL BRIEF

COMMISSIONER FOR PATENTS
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SIR:

This is an appeal of the Final Rejection dated December 18, 2002 of Claims 16, 17, 19-34 and 36-38. A Notice of Appeal, along with a petition for a two-month extension of time, was timely filed on May 19, 2003.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Saint-Gobain Vitrage having an address at 18 Avenue D'Alsace, Courbevoie, France F-92400.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 16, 17, 19-34 and 36-38 stand rejected and are herein appealed. Claims 18 and 35, the remaining claims in the application, are allowed.

IV. STATUS OF THE AMENDMENTS

No Amendment under 37 CFR 1.116 was filed, although a Request for Reconsideration after Final, along with a Declaration under 37 CFR 1.132, was timely filed on May 19, 2003. In an Interview Summary dated June 11, 2003, the Examiner confirmed that all rejections under 35 U.S.C. § 112 are withdrawn.

V. SUMMARY OF THE INVENTION

As recited in independent Claim 16, the invention is a glazing comprising (a) at least one electrically controllable system having variable optical and/or energy properties, (b) at least one coating for adjusting the optical appearance conferred on the said glazing by the said system, said at least one coating having antireflection properties in the visible, wherein said coating having antireflection properties is deposited on at least one of the external faces of said glazing and comprises a stack of thin layers having alternately high and low reflective indices or a graded-

refractive-index layer, and (c) at least one coating for attenuating/modifying the color of the glazing in reflection, wherein component (c) acts to lower C* saturation values in the (L, a*, b*) colorimetry system of the glazing in reflection.

See original Claims 1, 2 and 4, and the specification at page 6, lines 15-26 and page 9, lines 4-24.

VI. ISSUES

(1) Whether Claims 16-17, 19-24, 30-34, 36-38 are unpatentable under 35 U.S.C. §103(a) over U.S. 5,777,779 (Hashimoto et al) in view of U.S. 6,366,013 (Leenders et al), and in view of either one of U.S. 6,040,939 (Demiryont et al), U.S. 6,379,788 (Choi et al), U.S. 5,780,160 (Allemand et al), or U.S. 5,805,330 (Byker et al);

(2) Whether Claims 25-26 are unpatentable under 35 U.S.C. §103(a) over the above combination of prior art in (1), and further in view of U.S. 5,800,918 (Chartier et al); and

(3) Whether Claims 27-29 are unpatentable under 35 U.S.C. §103(a) over the above combination of prior art in (1), and further in view of U.S. 6,362,121 (Chopin et al)?

VII. GROUPING OF THE CLAIMS

Dependent Claims 19, 20, 23 and 24 each stand or fall separately from Claim 16.

VIII. ARGUMENT

Claims 16-17, 19-24, 30-34, 36-38 stand rejected under 35 U.S.C. §103(a) as unpatentable over Hashimoto et al in view of Leenders et al, and in view of either one of Demiryont et al, Choi et al, Allemand et al, or Byker et al.

Claims 25-26 stand rejected under 35 U.S.C. §103(a) as unpatentable over Hashimoto et al in view of Leenders et al, and in view of either one of Demiryont et al, Choi et al, Allemand et al, or Byker et al, and further in view of Chartier et al.

Claims 27-29 stand rejected under 35 U.S.C. §103(a) as unpatentable over Hashimoto et al in view of Leenders et al, and in view of either one of Demiryont et al, Choi et al, Allemand et al, or Byker et al, and further in view of Chopin et al.

Those rejections are untenable and should not be sustained.

As recited in independent Claim 16, the invention is a glazing comprising (a) at least one electrically controllable system having variable optical and/or energy properties, (b) at least one coating for adjusting the optical appearance conferred on the said glazing by the said system, said at least one coating having antireflection properties in the visible, wherein said coating having antireflection properties is deposited on at least one of the external faces of said glazing and comprises a stack of thin layers having alternately high and low reflective indices or a graded-refractive-index layer, and (c) at least one coating for attenuating/modifying the color of the glazing in reflection, wherein component (c) acts to lower C* saturation values in the (L, a*, b*) colorimetry system of the glazing in reflection.

When both the antireflection and attenuating/modifying coatings are present, superior results are obtained, which are unobtainable without both layers, or without the antireflection

coating. This superiority is demonstrated in the comparative data of record, and particularly, in Examples 3 and 4, described in the specification beginning at page 18, line 37. Better filtering properties toward heat rays, higher TL values in the bleached state (with a TL that can reach 80%, which is a real achievement for an electrochromic glazing, because the electrochromic layers, even in the bleached state, do remain a little bit absorbing). So, the anti-reflecting stack of thin layers acts in synergy with the electrochromic system, thermally **and** optically, both in the colored and uncolored state of the electrochromic system, which combination of both thermal and optical effects could not have been predicted.

Example 3 is according to the claimed invention; Example 4 contains no antireflection coating. As disclosed in the specification beginning at page 19, line 28, the optical properties of the glazing were improved when at least one coating attenuating the color or an antireflection coating was provided, but the maximum improvement was obtained by using both types of coating together. The following optical properties in the bleached state (+1.2 V supply), and in the colored state (-1.6 V supply) were compared for Examples 3 and 4:

light transmission T_L (%);

values of a_{TL}* and b_{TL}* in the (L*, a*, b*) system in transmission;

light reflection R_{L1} on the "internal side" and the corresponding a* and b* values;

light reflection R_{L2} on the "external side" and the corresponding a* and b* values;

energy transmission T_E (%);

energy reflection R_{E1} (on the external side);

energy reflection R_{E2} (on the internal side), and

solar factor SF (the solar factor is the ratio between the total energy entering the room through the glazing to the incident solar energy).

This data is shown in the specification at (corrected) Table 1 and Table 2 at page 21, and at page 22, lines 1-8, wherein for Example 3, the SF is 33% in the coloured state (-1.6 V) and 73% in the bleached state (+1.2 V); and for Example 4, the SF is 32% in the coloured state and 67% in the bleached state.

As disclosed in the specification at page 22, lines 9-24:

> It may be seen from this data that, in the case of Example 3 according to the invention, it is possible to achieve a wider light transmission range and, in particular, to achieve a T_L of almost 80% in the bleached state. The energy transmission in the bleached state of Example 3 is also lower than that of Example 4 and the energy reflections are higher, whether in the coloured sate or in the bleached state. Example 4, which has only the anti-colour coating, already shows an improvement over standard electrochromic glazing, especially with regard to R_{L1} and R_{L2} colorimetry in reflection. But Example 3, in which an antireflection coating has been added, allows the T_L range to be broadened towards higher values and allows the glazing to be made more effective from the standpoint of the filtration of thermal, especially solar, radiation.

The presently-claimed subject matter is neither disclosed nor suggested by the applied prior art.

Hashimoto et al is drawn to an electrochromic device which, as noted by the Examiner, may contain an anti-reflection coating in the form of multi-layers composed of a plurality of different kinds of monolayers on an exposed surface of the substrate for the electrochromic device (column 3, lines 2-7).

Leenders et al discloses an anti-reflection coating, which may be a stack of layers having alternatively very low and very high refractive indices (column 7, line 40 - column 8, line 10), for

reducing the reflection of information displays such as electrochromic displays (column 10, line 63).

The Examiner relies alternatively on Demiryont et al, Choi et al, Allemand et al, and Byker et al, as meeting the terms of the presently-recited at least one coating for attenuating/modifying the color of the glazing in reflection. Demiryont et al disclose an anti-solar, low-emissivity functioning multi-layer coating on a transparent substrate, wherein the substrate may be an electrochromic device (column 6, line 18), which multi-layer coating, as shown in Fig. 2 and disclosed at column 7, line 36 ff, may contain a color control layer between the substrate and a first anti-reflecting coating. Demiryont et al discloses that the color control layer is preferably formed of silicon or tungsten metal, and its purpose is to achieve both enhanced uniformity and desired hue or color of the coated article, wherein uniformity of color refers to reduction in blotchiness or the like which may otherwise appear in a coated article (column 7, lines 36-52). Choi et al discloses an anti-reflection film wherein, in an embodiment for so-called "flat screen" cathode ray tubes, dark screen color is provided by applying to the glass of the screen an anti-reflection film having at least one colored layer therein, wherein the colored layer may be separate from all the other layers of the film and serves solely to provide the necessary tint (paragraph bridging columns 7 and 8). Allemand et al disclose an electrochromic device sandwiched between two transparent substrates, which substrates may have a coating on the outward facing surface, which may be, *inter alia*, an anti-reflection coating and a colored coating (column 7, lines 48-59). Byker et al disclose an electro-optic window incorporating a discrete photovoltaic device, which may contain an optional layer, such as a layer of, *inter alia*, an anti-reflection and/or a color suppression material or materials deposited between a

transparent conductive material **16** and front glass rear face **12**b and/or between transparent conductive material **18** and rear glass front face **14**a to suppress or filter out any unwanted portion of the electromagnetic spectrum (column 5, lines 61-67).

Chartier et al discloses a multi-layered hydrophobic window glass comprising one or more layers and a hydrophobic-oleophobic, abrasion-resistant coating which may include a layer of hydrolyzable fluorinated alkylsilanes.

Chopin et al discloses a substrate coated with a coating having a photocatalytic property based on titanium dioxide at least partially crystallized in the anatase form.

The fundamental flaw in all of the above rejections is that none of Demiryont et al, Choi et al, Allemand et al, and Byker et al disclose a coating for attenuating/modifying the color of the glazing in reflection, as that term would be understood from the disclosure, and as recited in independent Claim 16. This layer acts to lower C* saturation values in the (L, a*, b*) colorimetry system of the glazing in reflection, and thus has a function different from the color control layer of Demiryont et al, different from the colored layer of Choi et al, and different from the colored layer of Allemand et al. Furthermore, while it is not clear from Byker et al precisely how their color suppression layer functions, nevertheless, Byker et al require that their anti-reflection layer, if present, be at a location **within** their electro-optic window, rather than on an external face thereof, as required by the present claims. Thus, if one skilled were to combine Byker et al with Hashimoto et al and Leenders et al, even if there was some overlap between present component (c) and Byker et al's color suppression layer, the result would not be the presently-claimed invention.

Neither Chartier et al nor Chopin et al remedy any of the deficiencies of rejection (1), since neither disclose or suggest the glazing of Claims 16.

Claims 19 and 20 are each separately patentable. The Examiner relies on Hashimoto et al's disclosure of a layer of yttrium oxide (column 3, lines 48-55). But this layer is part of mixture layer 4, which is part of the electrochromic device, therein. None of the applied prior art discloses or suggests yttrium oxide as part of coating (c) herein.

Claims 23 and 24 are each separately patentable because, contrary to the finding by the Examiner, the first conductive layer and second conductive layer of Hashimoto et al are not analogous to the carrier substrate and primer/tie-layer coating of these claims.

In an Advisory Action, dated June 6, 2003, the Examiner's response to the above arguments regarding Demiryont et al, Choi et al, Allemand et al and Byker et al is simply a reference to page and line where the application of these references is discussed in the Final Office Action. But the Examiner never explains how the respective layers relied on in each of these references meets the terms of presently-recited component (c).

Regarding the separate patentability of Claims 19 and 20, the Examiner asserts that absent a showing of unexpected results, it would have been obvious to one having ordinary skill in the art to make the coating for attenuating/modifying the color "from any suitable material, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use." The Examiner further points to Demiryont et al at column 7, lines 36-52, wherein Demiryont et al disclose that it will be within the ability of those skilled in the art, given the benefit of Demiryont et al's disclosure, to select a suitable material and thickness for the color control layer therein.

In reply, since none of the applied prior art disclose or suggest the presently-recited at least one coating for attenuating/modifying the color of the glazing in reflection, whether one skilled in the art would know how to select such materials is irrelevant. That one skilled in the art could choose applicable color control layer materials in Demiryont et al is also irrelevant since, as discussed above, the color control layer of Demiryont et al is different from presently-recited component (c).

Regarding the separate patentability of Claims 23 and 24, the Examiner contends that Applicants have failed to supply any basis for why the rejection of these claims is improper.

In reply, the basis was (and is) supplied both in the above-referenced Request for Reconsideration After Final, and the present Appeal Brief.

Accordingly, it is respectfully requested that these rejections be REVERSED.

IX. CONCLUSION

For the above reasons, it is respectfully requested that all the rejections still pending in the Final Office Action be REVERSED.

Respectfully submitted,

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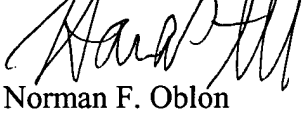

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APPENDIX

CLAIMS ON APPEAL

16. Glazing comprising (a) at least one electrically controllable system having variable optical and/or energy properties, (b) at least one coating for adjusting the optical appearance conferred on the said glazing by the said system, said at least one coating having antireflection properties in the visible, wherein said coating having antireflection properties is deposited on at least one of the external faces of said glazing and comprises a stack of thin layers having alternately high and low reflective indices or a graded-refractive-index layer, and (c) at least one coating for attenuating/modifying the color of the glazing in reflection, wherein said at least one coating of component (c) acts to lower C* saturation values in the (L, a*, b*) colorimetry system of the glazing in reflection.

17. Glazing according to Claim 16, wherein the coating (b) also has antistatic properties, and includes a stack of thin layers at least one of which is made of an electrically conductive material comprising a doped-metal-oxide or conductive-polymer.

19. Glazing according to Claim 16, wherein the coating (c) includes a thin layer having a refractive index of between 1.6 and 1.9.

20. Glazing according to Claim 19, wherein the thin layer having a refractive index of between 1.6 and 1.9 is based on at least one of aluminum oxide Al_2O_3, yttrium oxide Y_2O_3, silicon oxycarbide SiOC, and silicon oxynitride SiON.

21. Glazing according to Claim 16, wherein the coating (c) includes at least two superposed thin layers whose average refractive index is between 1.6 and 1.9.

22. Glazing according to Claim 21, wherein the at least two superposed thin layers whose average refractive index is between 1.6 and 1.9 is an SnO_2/SiO_2 or $SnO_2/SiO_2/SnO_2$ stack.

23. Glazing according to Claim 16, additionally including a carrier substrate and a primer/tie-layer coating for the electrically controllable system (a) with respect to the carrier substrate.

24. Glazing according to Claim 23, wherein the carrier substrate comprises a polymeric/plastic material.

25. Glazing according to Claim 16, which also includes a coating having hydrophilic/antimisting properties or having hydrophobic/anti-rain properties on at least one of its external faces.

26. Glazing according to Claim 25, wherein the coating having hydrophobic properties includes at least one layer comprising a composition having at least one fluoroalkoxysilane, the alkoxy functional groups of which are directly linked to the silicon atom, a system of one or more aqueous solvents and at least one catalyst which is an acid and/or a Brönsted base.

27. Glazing according to Claim 16, which also includes a coating having photocatalytic/antifouling properties.

28. Glazing according to Claim 27, wherein the coating having photocatalytic/antifouling properties is located on at least one of its external faces.

29. Glazing according to Claim 28, wherein the coating having photocatalytic/antifouling properties comprises TiO_2 at least partially crystallized in the anatase form.

30. Glazing according to Claim 16, which also includes at least one coating having electromagnetic screening properties.

31. Glazing according to Claim 16, wherein the electrically controllable system (a) is a superposition of functional layers placed between two carrier substrates, each of the said substrates independently being rigid, semi-rigid or flexible.

32. Glazing according to Claim 31, wherein the electrically controllable system (a) includes, as carrier substrate, at least one rigid substrate of which the glazing is composed, and/or at least one flexible carrier substrate associated by lamination, with a rigid substrate of which the said glazing is composed.

33. Glazing according to Claim 16, wherein the electrically controllable system (a) is a superposition of functional layers placed on a carrier substrate and provided with an inorganic or polymeric layer protective film.

34. Glazing according to Claim 33, wherein the protective film is in the form of a lacquer or of a varnish.

36. Glazing according to Claim 16, wherein the electrically controllable system (a) is an all-solid electrochromic system.

37. Glazing according to Claim 16, wherein electrically controllable system (a) is in the form of a system comprising one or more reversible-insertion materials of the electrochromic system or gasochromic system type, or in the form of an optical-valve or viologen-based system.

38. Glazing according to Claim 16, wherein electrically controllable system (a) is in the form of a liquid-crystal or cholesteric-gel system.